MANGALORE UNIVERSITY

Final Synopsis of Thesis Entitled

Perception and Satisfaction of Customers towards E-Banking and its Impact on Financial Performance of Banks in Yemen

To be submitted to Mangalore University for the award of

DOCTOR OF PHILOSOPHY
IN
COMMERCE

Research Scholar

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Ref No: MU/EXB/Ph.D./CR.19/Com./2019-20/E.13, Dated 23/07/2019

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1. Introduction

Banks are one of the most vital financial institutions in the money markets for the economy of any nation since they play a strategic role in implementing monetary policies to achieve goals of nations. They contribute substantially to the economic and social development as they are the only economic mediator that undertakes the process of accumulating financial resources through savings to be reoriented in the financing process for economic institutions. The development in information and communication technology and the expansion in the use of the Internet, which the world is witnessing, have brought a global revolution that impacted every aspect of life, including the financial transaction sector and banking in particular. These innovations lead to the emergence of electronic banking (e-banking) which is a branch of e-commerce. E-banking has become a global concept, and it has been in extensive use in developed countries, with developing countries, one of which is the Republic of Yemen, seeking to follow the lead.

In the highly competitive environment of the banking industry, banks need to keep up with the fast changing development in information and communication technologies to satisfy customers' needs. Thus, for banks' survival and progress, they have no choice other than providing electronic services, especially with the world's becoming a highly connected global village. However, it was found that the mere presence of companies on the web was not enough for their success in e-business (Parasuraman, Zeithaml, & Malhotra, 2005), and issues of service quality became essential for success in the business model of financial institutions which depends on customer satisfaction, in which improved service quality is one of the mechanisms of ensuring customer satisfaction (Mujinga, 2020). Thus, provision of quality e-banking service reflects on customer satisfaction and loyalty, which reflects, in turn, on banks' financial performance.

Financial performance is the most important indicator of banks' performance. It is the measure of the financial health of banks and reflects the degree to which their objectives have been accomplished. In other words, it measures the results of the bank polices and operations in monetary terms. The majority of studies revealed that the provision of electronic banking services had a positive impact on banks' financial performance (e.g., Mateka, Gogo & Omagwa, 2016; Mawutor, 2015), whereas fewer studies indicated that it had a negative effect (e.g., Halili, 2014; Atavachi, 2013). However, there is scarcity

in the studies that shed light on the impact of the provision of electronic banking services on banks' financial performance in Yemen.

Yemeni banks, like any other banks in the world, seek to attract new customers and retain the current ones, so for their survival in the highly competitive banking environment, banks in Yemen have made efforts to keep up with the technological advancements in providing electronic banking services to meet their customers' needs. Since the business model of financial institutions depends on customer satisfaction, and since improved service quality is one of the mechanisms of ensuring customer satisfaction (Mujinga, 2020), there is need to find out the extent to which banks in Yemen have been successful in gaining customer satisfaction and in providing quality e-banking service, especially with the scarcity in the studies that focused on the measurement of e-banking service quality and customer perception and satisfaction toward e-banking service in Yemen.

This study will focus on investigating the perception and satisfaction of customers towards e-banking and the impact of using e-banking on the financial performance of banks in Yemen.

2. Electronic Banking

Banking industry, like most other industries, has been through substantial transformation due to the innovation in information technology that impacted the entire business world. The development and expansion in the use of the Internet in particular had a vital role in the emergence of e-commerce, which lead to a transition from the 'brick and mortar' structure to the 'click and order' model of business thereby bringing about new possibilities. E-banking is a branch of e-commerce in "what can be described as B2C (Business to Customer) domain for banking industry" (Reserve Bank of India, 2001). E-banking has become a global concept, and it has been in extensive use in developed countries with developing countries following the lead.

2.1. Definition and Concept of E-Banking

Literature shows that different terms have been used by different authors to refer to the concept of electronic banking. These terms include: e-banking, virtual banking, net banking or internet banking, online banking, web banking and digital banking. These terms are often used interchangeably by authors to refer to the banking services which

enable a customer to perform banking transactions electronically without visiting a brick-and-mortar institution. E-banking has been defined by different authors as follows.

Daniel (1999) mentioned that the term electronic banking "is used to describe the provision of information or services by a bank to its customers, via a computer or television" (p. 72).

The Federal Financial Institutions Examination Council FFIEC (2003) defined e-banking as "the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels. E-banking includes the systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network, including the Internet" (p. 1).

Uppal (2007) stated that e-banking "is a generic term encompassing internet banking, telephone banking, mobile banking etc. In other words, it is a process of delivery of banking services and products through electronic channels such as telephone, internet, cell phone etc" (p. 17).

Sharma (2014) defined e-banking as being an entirely automated facility based on IT delivery mechanism to banking products and services.

Dangwal, et al. (as cited in George & Kumar 2017) defined e-banking as "the use of technology for accessing banking services electronically be it for paying bills, transferring funds, viewing accounts or obtaining information and advice. It refers to the electronic services that are made available to customers through phone, personal computer, television and internet" (p. 5).

Kalani (2018) stated e-banking "is an electronic payment system wherein customers of a given bank can perform all their banking transactions. In other words, e-banking refers to all the financial transactions undertaken by any financial institution over the internet."

After reviewing previous definitions and to provide a more comprehensive definition, the researcher defines e-banking operationally as an internet-based electronic system made available by banks to their customers, being individuals or

businesses, to enable them to perform all their financial transactions including paying bills, transferring funds, viewing accounts or any other related transactions, via electronic means such as mobiles, computers, ATM etc.

2.2. E-Banking Channels and Services

E-banking is continuously evolving and has been influenced by the information technology development and the expansion in the use of the Internet. Thus, it has been delivered through various channels and facilities since its early introduction. Earlier, e-banking was delivered via telephone lines and television and computer monitors to homes and offices. In course of time and the continuous development in technologies, more channels were used for delivering e-banking service, such as mobiles and POS devices, with the result that e-banking is currently made available anytime and anywhere. The channels and facilities through which e-banking services are delivered are described below.

2.2.1. ATM

ATMs are electronic banking outlets, which allow customers to perform many banking transactions without the help of any bank representative or teller. It is a machine that can be treated as a mini bank branch. There are host of banking activities that can be performed through ATMs, such as Withdrawal of cash, make balance inquiry, obtain mini statement, open fixed deposit, transfer funds, pay credit card bills, request for cheque book, update mobile No., recharge mobile phones, pay insurance premium, pay utility bills, deposit cash and deposit cheques (Indian Institute Banking and Finance, 2016).

2.2.2. Internet or online banking

Internet Banking is a channel of e-banking service which allows customers to do several financial and non-financial transactions through the internet. Customers can use their PCs or laptops and an internet connection to use this channel. With the help of Internet Banking, a customer can transfer funds to another bank account, check their account statement, pay utility bills and do a lot more (ICICI bank, 2019).

2.2.3. Mobile banking

Globally, mobile banking has evolved rapidly from a transactional feature to an experience-driven comprehensive customized offering. Today, it plays a vital role in the digital strategies of all banks worldwide. A mobile banking transaction is far more economical than a transaction done through traditional banking channels, in terms of either per-transaction costs or per-branch costs. Today, banks are offering mobile banking services to their customers through various channels such as SMS and mobile banking applications.

a. Mobile banking: SMS based channel

SMS channel has its own advantages, viz., wider acceptance and usage, and they are available in all kinds of mobile handsets (both GSM and CDMA), etc. Banks have been offering many kinds of mobile banking services though SMS channel viz.:

- Non-financial transactions: balance enquiry, mini statement, cheque book request and transaction alerts.
- Financial transactions: funds transfer, mobile/DTH recharge and bill payments

b. Mobile banking: Application based channel

Almost all banks have been offering application based mobile banking services to their customers. The application is offered on multiple platforms such as Android and IOS. Bank customers need to download the application and can avail host of banking services such as:

- Non-financial transactions: balance inquiry, mini statement, cheque book request.
- Financial transactions: fund transfer, mobile/DTH recharge, bill pay etc.
- Others: cards. Loans, forex, investment and insurance, internet banking features etc.

Once downloaded these mobile banking applications are easy and efficient for use by their customers who are proficient in using smart phone applications.

c. Mobile Wallets

In recent years, the payments industry has witnessed many innovations in the payment systems and, especially in the area of mobile payments. With the increase in mobile subscriber base and the mobile internet usage in the world, opportunities have arisen for creation of a new business line. One of these has been the Mobile Wallet. A Mobile Wallet is a mobile-based virtual container, where the user can preload a certain amount in his/her account created with the mobile wallet service provider, and spend it (Indian Institute Banking and Finance, 2016). Examples of mobile wallet service providers are Google Pay, Amazon Pay, PayTm etc.

2.2.4. Cards

A payment card is a usually a plastic card—that allows its user to make an electronic payment. The most common types of payment cards are credit cards and debit cards. All types of cards are uniquely linked to some or other types of account at the back end. This account can be with a banking entity/non-banking entity which has issued the card. (Indian Institute Banking and Finance, 2016). Customer can use the card to pay at POS outlets, shop online, and withdraw cash from ATMs (ICICI bank, 2019).

2.2.5. Point-of-Sale (POS)

POS terminals are small payment devices installed at merchant locations, usually by banks. A typical POS terminal consists of devices for reading cards, various ports, printers and connection with a computer system. Besides, there is a modem for call-bank. The customer can purchase a product and opt to pay via a debit/credit card by swiping or inserting the card at the POS terminal (Indian Institute Banking and Finance, 2016).

3. Customer Perception

Customer perception is a marketing concept. It plays a vital role in the business ability to attract new customers and to retain the existing ones. It is the individual's perceived image which he/she expects from any product or service (All Answers Ltd, 2018a). Umadevi, (2017) stated that "customer perception refers to the process by which a customer selects, organizes, and interprets information or stimuli inputs to create a meaningful picture of the product or the service" (p. 12). According to Pickens (2005),

perception is the process by which a person interprets a situation or stimuli into something meaningful to him or her based on their prior experiences. Yet, what an individual interprets or perceives may be substantially different from reality (Pickens, 2005) since perception is created based on individual's cultural background, demography, and previous experience (Mok et al., cited in All Answers Ltd., 2018b). What is considered to be quality service is different from person to person and may shift over time (Rao, 2019).

Companies can assess customer perception regardless of whether or not the customer has heard of the product or service, whether or not their opinion is positive or negative or whether or not they have made a purchase (Rao, 2019). They "have the ability to control many of the factors that build an individual's perception of the company/brand" (Bailey, n.d.), and they can start building positive customer perception before they introduce the product, while they are conceptualizing it, at the time of purchase, or even post-purchase (Rao, 2019).

For the purpose of the present and after reviewing previous definitions and notes on customer perception, the researcher defines customer perception operationally as customer's meaningful image about e-banking service that results from his/her interpretation of stimuli inputs related to e-banking regardless of whether or not the customer has used the service.

4. Customer Satisfaction

The economic growth of organisations lies in the hands of consumers; thus, to gain sustainable advantage in the highly competitive environment of the banking industry, banks need the consistent delivery of high-quality service in order to satisfy customer's needs. Once customers are satisfied about a particular organisation and its products or services, it will take some time for competitors to snatch customers or convince them to switch to them (Amoah-Mensah, 2010). Thus, banks need to intensify efforts to satisfy their customers.

Customer satisfaction is a positive emotional state that results from customers' evaluation of their experiences with the products or services they receive (Sleimi, Karam & Qubbaj, 2018). For Hansemark and Albinsson (2004) customer satisfaction is an overall customer attitude towards a service provider, or an emotional reaction to the difference between what customers expect and what they receive regarding the

fulfilment of some need, goal or desire. Fecikova (cited in Aborampah, 2010) indicates that satisfaction is the feeling of a customer which results from the process of evaluating what was received against what was expected.

Customer satisfaction is an ever-changing emotional state because it is related to their needs, wants and expectations, which change continuously. Kotler et al. (2017) assert that customer satisfaction depends on "a product's perceived performance in delivering value relative to a buyer's expectations" (p. 33). If products meet customer expectations, customers are satisfied. So, marketers must be careful to set the right levels of expectations because with too low expectations, they may fail to attract new customers, and with too high expectations, customers will be disappointed (Kotler et al., 2017).

For the purpose of the present study and after reviewing previous definitions of customer satisfaction, the researcher defines customer satisfaction operationally as the emotional state or reaction of a customer towards e-banking service that results from the process of evaluating his/her experience with the service they receive against what they expected.

Customer Satisfaction is a measure of the performance of the organisation's 'total product' in relation to a set of customer requirements (Hill & Brierley, 2017), and it is a significant indicator that predicts future customer behaviour; thus, measuring customer satisfaction is aimed at decisions making on how to improve the product or service (Hill, Roche & Allen 2007). Financial performance is impacted by customer satisfaction. If customer satisfaction is high, it leads to increasing the loyalty of existing customers, lowering marketing costs through positive word-of-mouth advertising and enhancing organization reputation etc. (Bhatti, Awan, & Razaq, 2014).

Customer satisfaction can be measured through monitoring a variety of indicators such as stock outs, number of complaints, customer loyalty index, customer lost, new customers, market share in term of customers and product quality (Bhatti, Awan & Razaq, 2014). Also organizations need to use data-gathering and analysis tools to help them measure customer satisfaction indicators. Smart organizations use a variety of tools to monitor customer satisfaction because no single tool is likely to provide the full information needed to truly measure customer satisfaction. However, Organizations rarely view these tools and systems as strategic initiatives, and usually

ignore them, which is a fatal error usually made at the top of an organization (Cochran, 2003).

5. Service and E-service Quality

Because of the increasing digitization, the services industry, such as banks, is providing electronic banking services because of its importance in increasing the competitive advantage and its important role in increasing profitability and customer satisfaction (Sathiyavany & Shivany, 2018). On the other hand, many companies considered service quality as a strategic tool, due to the increased competition in the service industry, where service quality has become more important at the present time, as it has an impact on customer satisfaction and loyalty (Yarimoglu, 2015). Similarly, in e-service, most e-retailers have realized that the quality of e-services perceived by customers is one of the most important factors for their success (Zhang, et al, 2015). And like any industry, service quality in banks is considered important factor to earn customer satisfaction (Rabbani, et al, 2016 and Ali & Raza, 2015).

Service quality plays an important role in marketing the service. High service quality boosts customer perception of the service value. To adopt the concept of service quality, banks need to respond to the needs of customers instead of depending on their own perceptions of customers' requirements (Howcroft, 1991). An analysis of service quality perceptions from banks' and customer's point of view will provide banks a quantitative estimate of their services which are perceived with intricate details such as whether banks are meeting, exceeding or are below the perceptions of their customers (Bhat 2005).

With the continuous increase in the use of technology and increased competition in various industries, including service industry, organizations had to provide e-services to their customers, which had to be high-quality e-services in order to increase their shares in the market. The quality of e-services has an important role in promoting customer's perception and satisfaction as is the case in traditional service quality. E-service quality differs significantly from traditional service quality settings as e-service lacks interpersonal contact and may pose greater perceived risk and privacy issues for customers, but a key benefit of e-service is the ability of firms to provide service to customers across different industries and countries (Blut, et al. 2015).

E-service quality has been defined by many of the authors who developed models for measuring e-service quality including Zeithaml, et al. (2002), Parasuraman, et al. (2005) and Wolfinbarger and Gilly (2003). Zeithaml, et al. (2002, p. 363) defined e-service quality as "the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery of products and services. As can be observed in this definition, the meaning of service is comprehensive and includes both pre– and post–Web site service aspects". Parasuraman, et al. (2005, p. 5) define e-service quality as the "extent to which a website facilitates efficient and effective shopping, purchasing, and delivery." Wolfinbarger and Gilly (2003, p. 183) define e-service quality as "the beginning to the end of the transaction including information search, website navigation, order, customer service interactions, delivery, and satisfaction with the ordered product."

Reviewing literature showed that there is a scarcity in the definitions of e-banking service quality in particular. Thus, for the purpose of the present study, the researcher defines e-banking service quality operationally as the extent to which the service, which is provided by the bank through electronic channels, consistently facilitates the prompt and safe fulfillment of financial transactions by customers in a smooth, simple and error-free manner with effective handling of problems if they occur.

6. Financial performance

Performance is a general term that covers the financial and the non-financial aspects of an organisation's activity. Generally, it is used to refer to the realization of the organisation's set goals and objectives (Odhiambo & Ngaba, 2019). It is significant for the growth of any business to evaluate its performance and whether or not it has been achieving its set goals and objectives. Financial performance is one of the most important indicators of organisational performance. Constant evaluation of financial performance is one of the most important internal activities in every business including the banking industry. Financial analysis helps in evaluating the present condition and predicting future perspectives (Jasevičienė, Povilaitis & Vidzbelytė, 2013).

Financial performance basically refers to the act of performing financial activity, and it is a measure of how well an organisation can use assets from its primary mode of business and generate revenues (Asia, 2015). It is a measure of financial health

of a business over a particular period of time and reflects the degree to which financial objectives have been accomplished. Financial performance refers to measuring the results of organizations' polices and operations in monetary terms. These results are reflected in the organization's return on investment, return on assets and value added (Noveu, cited in Atavachi, 2013). The purpose of financial performance evaluation is to provide sound information to shareholders and stakeholders to help them in making decisions (Naz, Ijaz & Naqvi, 2016). It can be used to compare the performance of an organization for different periods of time or the performance of different organizations in the same industry.

Financial performance analysis is "a process of systematically making a proper, critical and comparative evaluation of profitability and financial health of a firm through the applications of financial statement analysis" (Vanlalzawna, 2018, p. 11) as financial statements are the only eligible documents on which financial performance can be evaluated. The first step in financial performance analysis is the identification of performance indicators that are related to the purpose of analysis. The indicators of financial performance can be classified into five groups: liquidity ratios indicators, activity ratios indicators, profitability ratios indicators, leverage ratios indicators and coverage ratios indicators (Atavachi, 2013). The most common measure of bank performance is profitability, and the main indicators used in evaluating bank profitability are: Return on Asset ROA and Return on equity ROE (Adam, 2014; Mwangi, 2014; Ngumi, 2013; Onay et al., 2008; Sackitey, 2016).

7. E-Banking in Yemen

Yemeni banks, like any other banks in the world, seek to attract new customers and retain the current ones, so for their survival in the highly competitive banking environment, they need to keep up with the technological advancements in providing banking services, which became available in the form of electronic services.

The operating banks in Yemen have made great effort to adopt new technologies in order to be able to meet customers' needs of both the public and private sectors in areas such as e-commerce activities and Internet technology service, and the first two banks to offer internet banking service in Yemen were the Arab Bank (AB), and Yemen Gulf Bank (YGB) in 2002. When Internet banking service emerged in Yemen, local

banks in Yemen offered online information services only, such as access to sources of general information about the banks, detailed institutional information, services promotional information, bank's branches locations and detailed information about the board of directors, call details, and information on special actions. Foreign banks, on the other hand, went beyond those features to provide the customers links to other community information, advertisements, and search engines. With the exception of the Yemen Gulf Bank (YGB) and the Yemeni Commercial Bank (YCB), that had an interactive website similar to those of their foreign counterparts, foreign banks were doing better than local banks in the information delivery field at higher levels of interactivity (Al-Ajam & Nor, 2013).

Authority in Yemen made efforts to encourage banks and financial institutions to adopt electronic banking service. In 2000, the Central Bank of Yemen issued an act (Act No. 14 for the year 2000), in which it stated that among the tasks and functions of the Central Bank is "Encouraging and simplifying payment system procedures" (Institute of banking studies, 2020). later, Act No. 40 for the year 2006 regarding payment systems, and electronic financial and banking operations was issued by the Parliament, which established many issues related to payment systems, such as the recognition of electronic data, bonds and electronic transfer, and their authority to prove in Yemeni courts, and giving the central bank regulatory, supervisory and monitory powers to regulate payments. This act also stated that proof may be permissible in banking cases by all methods of proof, including electronic data or data issued by computers or correspondence with telex or fax machines or other similar devices. In addition, it confirmed that electronic transactions and signatures have the same effects as a signature and written transactions (Central Bank of Yemen, n.d.). Based on Act No. 14 for the year 2000 and Act No. 40 for the year 2006, and within the framework of the Central Bank's efforts to enhance financial inclusion and access to banking services to the largest segment of citizens in all geographical areas in the Republic, and realizing the importance of providing electronic money services via mobile phone, it issued, at the end of the year 2014, Circular No. 11 for the year 2014 regarding the regulatory rules for electronic money services via mobile phone. In 2019, the Central Bank Board of Directors Resolution No. (1) for the year 2019 was issued to establish the General Administration of Payment Systems, and to define its responsibilities and administrative structure, which is considered a very important step in developing and

supervising payment systems. On March 8th, 2020, the Central Bank Governor Resolution No. (1) for the year 2020 was issued regarding the instructions regulating the provision of financial institutions to electronic payment services via mobile phone, which is considered an advanced step in allowing financial institutions to provide electronic money services via mobile phone, which will open the way for Finance and Communications' companies to enter the field of providing and contributing to the spread and development of electronic banking service (Institute of banking studies, 2020).

Although Yemen has issued the legislative act regarding payment systems and electronic financial and banking operations in 2006, the payment function has not received the required attention. Therefore, the indicators of payment systems in Yemen are considered the lowest at the Arab and regional level. The statistics indicate that only about 10 % of Yemenis have accounts, including electronic money accounts, at the end of 2019. The impact of the unjust war waged on our country and the blockade has been disastrous on the banking sector, as the volume of payments in various payment instruments decreased by about 30% in 2015, the year in which the war on Yemen was launched, compared to 2014 and decreased to its lowest level in 2017 by about 50% compared to 2016. Then, it gradually improved in 2018 and 2019, with an increase of 17% and 41%, respectively, compared to the previous year (Institute of banking studies, 2020). However, despite the limited developments in the provision of electronic banking services in Yemen, the ongoing war and the destruction of the infrastructure affected the banking and financial services in general.

7.1. E-Banking Channels Provided by Banks in Yemen

Yemeni banks are constantly trying to provide modern and advanced electronic services to meet customer needs and expectations and thereby raise customer satisfaction. Although many Yemeni banks have worked to provide many electronic services, they still do not live up to what is implemented in most countries of the world. The following table (1) shows the e-banking channels provided by banks in Yemen.

Table 1 E-Banking Channels that Provided by Banks in Yemen

#	Bank	ATM	SMS	Card	Mobile Banking	Internet Banking	POS	E-Money	Phone Banking	Company Banking
1	**Yemen Bank for Reconstruction and Development**	√	√	√	√	X	X	X	X	X
2	**National Bank of Yemen**	√	√	√	X	X	X	X	X	X
3	**Arab Bank Limited**	√	√	√	X	√	X	X	√	X
4	**United Bank Limited**	√	√	√	√	√	X	X	X	X
5	**International Bank of Yemen**	√	√	√	X	√	√	X	√	X
6	**Yemen Kuwait Bank**	√	√	√	√	√	X	√	X	X
7	**Cooperative Agricultural Credit Bank**	√	√	√	√	√	√	√	√	√
8	**Yemen Commercial Bank**	√	√	√	X	√	√	X	√	X
9	**Tadhamon International Islamic Bank**	√	√	√	√	√	X	√	√	X
10	**Saba' Islamic Bank**	√	√	√	X	√	X	X	X	X
11	**Yemen Gulf Bank**	√	√	√	X	√	X	X	√	X
12	**Shamil Bank of Yemen & Bahrain**	√	√	√	X	√	X	X	X	X

13	**Al-Amal Microfinance Bank**	X	√	X	X	X	X	√	X	X
14	**Alkuraimi Islamic MicroFinance Bank**	√	√	√	√	X	X	√	X	√

Source: Banks' websites

8. Summary of Previous Studies

Below is a summary of the previous studies related to the variables of the study. The reviewed studies included:

1. Studies on customer perception of and satisfaction towards e-banking service
2. Studies on difference in customers' perception towards e-banking service, customers' views on e-banking service quality and customers' satisfaction towards e-banking service across different demographic groups.
3. Studies on E-Banking Service Quality
4. Studies on the impact of e-banking service on banks' financial performance
5. Studies on e-banking in Yemen

8.1. Previous Studies on Customer Perception of and Satisfaction towards E-Banking Service

Harikanth and Gnanadhas (2020) found that the customers in Kanniyakumari District, India were not fully aware of the operational part of each channel and their transactional facilities.

Nair (2020) found that customers in Thiruvananthapuram, Kerala, India were not fully aware of some of the electronic banking services; majority of the customers were only aware of ATM. He also found that the majority of the customers from both urban and rural area were satisfied with e-banking services.

Nguyen and Tran (2020) found that perception of customer in Vietnam towards electronic banking in domains such as convenience, speed, security, procedure, ease of use, service costs, reliability, and quality of service was positive and most customers

felt that electronic banking was convenient, in addition there were considerable differences in perception of customers towards e-banking among ages, occupations, income levels, and frequency of using groups. And they also found that factors such as convenience, speed, security, ease of use, reliability, quality of service, and procedure were positively related to satisfaction of customer of e-banking in Vietnam.

Adams (2019), using a case study of Ecobank Ghana Limited, concluded that there was a high level of awareness and satisfaction of customers towards electronic banking products/services in Ghana.

Altobishi, Erboz and Podruzsik (2018) found that there was a positive relationship between customer satisfaction level and usage of electronic Banking among customers in Jordan where there was positive relationship between five indicators i.e. (convenience, cost, ease of use, personalization and customization and security) and customer satisfaction level and usage of electronic Banking. Only Privacy was not revealed to have an effect on Customer Satisfaction in Jordan.

Asiyanbi and Ishola (2018) discovered high utilization of electronic banking products (ATM (98%), internet banking (85%), electronic transfer (97%) in Ibadan metropolis, Oyo state, Nigeria. Customers were satisfied with e-banking due to its cashless nature, cash accessibility, saves time from bank visitation and seamless transactions.

Jahan and Khan (2018) found that there was a positive correlation between satisfaction of customers in Bangladesh and all the dimensions included in the study which were the following: awareness on internet banking implementation, opportunity of receiving good core service, adequacy on convenience and comfort, sufficiency on security and privacy policy, Speediness on resolution of problems, fair pricing and opportunity of saving, competence on interest policy and availability of current features. In addition, the three dimensions of good core service, sufficient security and privacy policy and fair pricing and cost saving were found to play the key role to retain the online customers.

Salimon, Mokhtar, Bin Yusoff and Adeleke, (2017) discovered that perceived usefulness, perceived ease of use and facilitating conditions were positively related to e-satisfaction of customers in Nigeria. While, perceived security had a negative relationship with e-satisfaction.

Erick (2015) showed that perception of customers on benefits of electronic banking in Dar Es Salaam, Tanzania were a driving force of customer involvement in electronic

banking, and perceptions of customers of risks associated with electronic banking could not fully restrict customers from using electronic banking.

Yitbarek (2015) found that the three dimensions of reliability, customers support and ease of use of e-service quality had strong influence on the level of electronic banking customers' satisfaction in both public and private commercial banks in Addis Ababa, Ethiopia.

Dhurup, Surujlal and Redda (2014) found that the following seven factors were the factors that influenced customer perception of online banking service quality in South African. These factors were assurance, responsiveness, ease of use, accessibility, fulfillment, speed and accuracy and contact.

Ong, Hong, The, Soh and Tan (2014) found that following factors: cost saving, risk and privacy, features availability and convenience were the key factors that impact internet banking usage of customers in Malaysia.

Yoon and Occena (2014 concluded that both security issues and usability (as determined by perceived usefulness and perceived ease of use) had significant effects on internet banking use with smart phones in Missouri, Columbia, and perception of users towards security moderated the relation between perceived usefulness and perceived ease of use on the one hand and internet banking use with smart phones on the other.

8.2. Studies on Difference in Customers' Perception towards E-Banking Service, Customers' Views on E-Banking Service Quality and Customers' Satisfaction towards E-Banking Service Across Different Demographic Groups.

Dhanya and Velmurugan (2021) found that that higher-educated, huge income customers in Kerala, India who used Internet banking and who had been using it for long periods had positive views towards e-banking services. In addition, gender and age were not found to have any effect on consumer satisfaction.

Harb and Saleh (2020) found that demographic factors, namely, age, income level, level of education and occupation, had impact on the adoption of e-banking by customers in Lebanon**.**

Hossain (2017) found that ATM use was highly influenced by most of the demographic variables, while internet banking, mobile banking and telephone banking were influenced by few demographic variables i.e. age, education, and income level of customers in Sylhet, Bangladesh.

Teka and Sharma (2017) showed that demographic factors, namely, age, income level, level of education and occupation of customers had no significant influence on customers' e-banking usage in Ethiopia, while gender of customers had influence on customers' e-banking usage.

Ganpathi (2016) found a significant relationship between the level of perception of customers in Tamil Nadu, India towards internet banking services and the following customer related variables: age, gender, educational qualification, employment status, monthly income, marital status, type of bank adopted and frequency of using internet banking. And there was no significant relationship between the level of perception toward internet banking services and the remaining two variables: type of family and area of residence.

Worku, Tilahun and Tafa (2016) found that the majority of the users of electronic banking in Gondar city, Ethiopia were the young, the educated, salaried individuals and students, whereas business men and women were not actively using the electronic banking services. Electronic banking was found to improve satisfaction of customers, reduce frequency of bank visit for banking service and reduce waiting time for customers.

Ramanigopal, Palaniappn, Hwmalatha and Mani (2011) found that the respondents who were highly satisfied with internet services in Erode District, India were the following groups with varying percentages as follows: 52% of the respondents between the ages of 26 years to 35 years old, 61% of the male respondents, 65% of the unmarried respondents, 44% of the post graduate respondents, 37% of the respondents employed in the private sector and 45% of the respondents having annual income below Rs. 3,00,000. Also, the study showed a significant association between the gender, education, occupation and annual income and insignificant association between the age, marital status and size of family of these attributes and the internet services used. The lack of security measures, fear of online threats and scams and lack of computer literacy

and internet options etc., were found to be the major problems of internet banking services.

8.3. Studies on E-Banking Service Quality

Das and Ravi (2021) revealed that dimensions of e-banking service quality (Reliability, Security and privacy, Website design & Responsiveness, and communications) had positive impact on customer satisfaction towards e-banking in the southern state of India, and among young people, website design was the most important dimension than others.

Landge (2021) found that dimensions of e-banking service quality (reliability, efficiency, and ease of use; responsiveness and communication; and security and privacy) had an impact on satisfaction of customers in Mumbai, India with the reliability dimension had the strongest impact.

Hadid, Soon and Amreeghah, (2020) showed that reliability, tangibility, empathy and assurance had a positive influence on customer satisfaction in commercial banks in Malaysia, while responsiveness had insignificant relationship with the customer satisfaction.

Hayati, (2020) identified seven dimensions of internet banking service quality. These dimensions were efficiency, system availability, fulfillment, privacy, responsiveness, compensation and contact. The study showed that dimensions of internet banking services quality had a positive and significant effect on customer satisfaction in Bandung, Indonesia.

Mujinga, (2020) showed that banks in South African were meeting customer expectations of service quality delivery, although there was room for improvement.

Omodele and Onyeiwu, (2019) showed that there was a significant relationship between customer satisfaction and e-banking service quality and e-banking service quality had a significant impact on customer satisfaction in Nigeria.

Hammoud, Bizri and El Baba, (2018) found that the four dimensions (efficiency and ease of use, reliability, security and privacy, and responsiveness and communication) of E-Banking service quality had a significant effect on satisfaction of customers in

Lebanon and the results found that reliability was the strongest dimension of E-Banking service quality affecting customer satisfaction.

Tharanikaran, Sritharan and Thusyanthy (2017) found that service quality of electronic banking was of a high level in Batticaloa district, Sri Lanka, and also the degree of customer satisfaction towards electronic banking was of a high level.

Asfaw (2017) found that there was a strong impact of both service quality and security on customer satisfaction, while the rest of the dimensions (access, time of delivery, ease of use, service quality and reliability) did not have a significant effect on customer satisfaction in Ethiopia.

Basel and Omar (2016) showed that Efficiency and Responsiveness dimensions of electronic service quality had significant and positive influence on customer satisfaction, the study also found that reliability and privacy dimensions of electronic service quality negatively were related to customer satisfaction in Jordan.

Sakhaei, Afshari and Esmaili, (2014) found that six service quality dimensions (reliability, efficiency, responsiveness, fulfillment, security / privacy and website design) had meaningful relationships with customer satisfaction towards Internet Banking and reliability had the most effect, while website design had the least effect on customer satisfaction in Tehran, Iran.

Yi, (2014) showed that assurance, transaction efficiency and service security had a strong positive relationship with customers' satisfaction in KunMing, China. Reliability, responsiveness, ease of use, customer support and performance had a moderate positive relationship with customers' satisfaction.

8.4. Studies on the Impact of E-Banking Service on Banks' Financial Performance

Madugba, Egbide, Jossy, Agburuga and Chibunna (2021) found that ATM, POS and NEFT had a significant effect on ROA of banks, while WEB had no effect on ROA of banks in Nigeria.

Lasmini, Budiarti, Tasman and Susant (2020) concluded that internet banking was positively and significantly correlated with the financial performance of Go Public Bank in Indonesia as measured by Return on Equity (ROE). Mobile banking was

positively correlated with financial performance of Go Public Bank in Indonesia but correlation was not significant.

Ariyasena and Jayarathne (2019) concluded that number of ATMs, net fee and commission income and the number of branches had a significant positive impact on the financial performance of banks as measured by Return on Assets (ROA) and the total assets showed a significant negative impact on the financial performance of banks in Sri Lanka.

Odhiambo and Ngaba (2019) found that e-banking had a positive and significant effect on the financial performance of banks in Kenya.

Yang, Li, Ma and Chen (2018) found that electronic banking improved the performance of banks in China in terms of return on assets ROA, return on equity ROE and operating margin OM. On the contrary, electronic banking had a slight impact on performance of banks with respect to net interest margin NIM and efficiency ratio.

Ajayi and Enitilo (2016) found that there was a positive relationship between internet banking and performance of banks in Ekiti State, Nigeria but it was not significant, and the study showed that e-banking services had an impact on bank performance.

S.M, KASSA and HAMID (2017) found that there was positive increase registered in the ratio of return on assets ROA, return on equity ROE and net interest margin NIM after the implementation of electronic banking services compared to the time before the introduction of the electronic banking services in Ethiopia.

Kamboh and Leghari (2016) showed that Point of Sales POS and Mobile Banking MOB had positive and significant impact, which indicated that an increase in these services lead to an increase in profitability of banks. On the other hand, the study showed that Call Center transaction CCT and Automated Teller Machines ATMs had a negative and significant impact on profitability of Pakistani banking industry.

Siddik. Sun, Kabiraj, Shanmugan and Yanjuan (2016) found that electronic banking began to contribute positively to Return on Equity (ROE) of bank with a time lag of two years while a negative impact was found in the first year of adoption in Bangladesh.

The study also found that there was a positive impact, though not significant, of electronic banking on Return on Assets (ROA) and Net interest Margin.

Akhisar, Tunay and Tunay(2015) used data from 23 developed and developing countries (Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Italy, Japan, Korea, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Sweden, Switzerland, Turkey, United Kingdom and United States) and aimed to analyze the impact of e-banking products on profitability performance of banks as measured by return on assets ROA and return on equity ROE. This study found that bank profitability of developed and developing countries was highly significantly affected by the ratio of the number of branches to the number of ATMs. Also some variables were found to be in contrast to the expected negative relationship because of diversity in the level of development of the countries, the socio-cultural structure and e-banking infrastructure.

Ngango, Mbabazize and Shukla (2015) found that e-banking system like TAM, pay direct, e- check conversion, mobile telephone banking and electronic transact had great impact on performance of Kigali bank in Rwanda because they increased profitability, reduced bank cost of operations and increased bank efficiency and bank asset.

Halili (2014) used data from five countries: United Kingdom, Germany, Poland, Latvia, and the Czech Republic, to study whether the adoption of online banking increased bank performance indicators, i.e., return on equity (ROE), return on assets (ROA) and margin. He found that the adoption of online banking was negatively related to the bank performance indicators.

Maihob (2014) revealed that there was a statistically significant effect of the use of information and communication technology on French banks customers' satisfaction. Regarding financial performance, the study found no statistically significant effect of information and communication technology on return on assets (ROA), while the effect on return on equity (ROE) was statistically significant.

Ngumi (2014) showed that innovations of banks influenced financial performance of commercial banks in Kenya positively, where they had a statistically significant influence on income, return on assets ROA, profitability and deposit of customer of commercial banks. The study also showed that mobile phone had a higher moderation

effect than internet devices on banks innovations when influencing commercial banks financial performance in Kenya.

Oyewole, Abba, El-maude and Gambo (2013) found that electronic banking began to contribute positively to performance of banks in Nigeria (in terms of return on asset (ROA), and net interest margin) with a time lag of two years but the impact was negative in the first year of adoption.

Al-Qudah, al-Hawary and al-Mehsen (2012) found that the increase in using electronic credit cards had a positive impact on the increase of net income, which in turn lead to an increase in return on equity (ROE) and consequently it had a positive impact on profitability of banks in Jordan.

8.5. Studies on E-banking in Yemen

Alzubi, Faree and Al-Dubai (2017) found that the three variables (technology, perceived ease of use and perceived usefulness) positively influenced the intention to use internet banking by small and medium sized-enterprises owners in Yemen. In addition, the study found that awareness was a significant mediating factor in the relationship among technology and perceived ease of use, and owners' intention to use internet banking, while awareness was a negative mediating factor in the relationship.

Al-Eryani and Alaraki (2015) found that Yemeni banks had good infrastructure requirements and good top supporting management, but the study revealed the following problems: laws and rules had not been established completely and clearly and there were some problems related to the human aspects. These problem were: employees did not have good training courses and they did not have good salaries, clients' attention was not drawn to the importance of the e-banking services and they lacked trust in e-banking services.

Al-Fahim, Jusoh and Abideen (2014) found that the environmental factors and competitive pressure had a strong and important influence on managers or owners intention to adopt internet banking services. The study also found that the supportive regulatory environment for legal protection and e-business supporting law as well as financial institutions support were significant and positive factors for adopting internet banking services among small and medium sized-enterprises in Yemen.

Al-ajam & Nor (2013) found that perceived relative advantage, perceived ease of use, perceived compatibility and perceived trialability had a significant effect on acceptance of customers of internet banking in Yemen.

Dabaen, K. S. E., (2013) found that there was a wide use of the e-banking services by the customers of the Yemeni banks in Taiz city,Yemen and customers were satisfied with the e-banking services provided by the Yemeni banks in Taiz city.

Al-Abdellat (2010) came up with a number of obstacles to the expansion of the use of electronic banking in Yemen sorted under the following categories: organizational, financial and other obstacles. Organizational obstacles are related to the lack in trained human cadre and lack in technological infrastructure. Financial obstacles are caused by the high costs of financial investment and the high administrative costs. Finally, other obstacles mainly include low e-banking awareness of customers, lack of trust, lack of legislative laws that protect banks to adopt e-banking and low number of customers using e-banking.

Zolait (2010) showed that the prominent predictors of Yemeni bank users' behavioural intention to use internet banking services included relative advantage/compatibility, user's information-based readiness, attitude, observability, technology facilitating condition, perceived behavioural control and self-efficacy.

9. Need and Significance of the Study

Electronic banking has become one of the main and significant services provided by banks, and banks are competing to provide electronic service that meet their customers' needs. Banks in Yemen, like other banks in the world, have made efforts to provide electronic services to their customers due to the increasing importance of adopting electronic services for the survival and progress of banks.

Bankers in Yemen need to measure their customers' perception and satisfaction towards e-banking service. Customer perception towards the service plays a vital role in the business ability to attract new customers and to retain the existing ones, but since what an individual perceives may be substantially different from reality (Pickens, 2005), there is need to find out how customers perceive the service. On the other hand, customer satisfaction is a significant indicator that predicts future customer behaviour;

however, customer satisfaction is an ever-changing emotional state because it is related to their needs, wants and expectations, which change continuously. Thus, there is need to continuously measure customer satisfaction because when customers are satisfied about a particular organisation and its products or services, it will take some time for competitors to snatch customers or convince them to switch to them (Amoah-Mensah, 2010).

In addition, bankers in Yemen need to measure the quality of their electronic service since service quality plays an important role in marketing the service. High service quality boosts customer perception of the service value, and leads to customer satisfaction, which help banks to retain their existing customers and attract new ones. If banks do not understand and measure these aspects, they may lose funds and customers. So, the present study provide banks with quantitative data that can help them take decisions that enable them to provide high quality service and to attract new customers and retain the existing ones. In addition, providing services without taking into account the accompanying financial aspects may not be worthwhile to banks. So, banks should measure the effect of electronic banking services on their financial performance. The present study provides quantitative data on the effect of e-banking services on financial performance, in terms of the indicators of profitability, e.g., Return on Assets ROA and Return on Equity ROE.

Also reviewing previous studies on e-banking services in Yemen in particular, revealed that, in summary, previous studies investigated the following factors:

the factors affecting the intention to adopt internet banking services among small and medium sized-enterprises in Yemen (Al-Fahim, Jusoh and Abideen, 2014; Alzubi, Faree and Al-Dubai, 2017), the factors that influence customers' acceptance to adopt internet banking (Al-ajam & Nor, 2013), the factors that influence customers' behavioral intention to use internet banking services (Al-Ajam & nor, 2013; Zolait, 2010), the availability of the essential requirements for e-banking adoption in Yemen (Al-Eryani and alaraki, 2015), the obstacles that hinder the expansion in the use of e-banking in Yemen (Al-Abdellat, 2010), and the customers' acceptance reactions to the e-banking services and the impact of the e-banking services on the customers' satisfaction in Taiz city (Dabaen, 2013). Thus, reviewing literature revealed that there is a great scarcity in the studies that investigate the current situation of e-banking service in Yemen and its quality and the studies that investigate customers' perception and satisfaction towards e-banking service, and a great scarcity in the studies that

provide quantitative evidences about the impact of e-banking service quality on customers' satisfaction towards e-banking service as well as the impact of e-banking service on the financial performance of Yemeni banks. Therefore, this study sought to bridge these gaps in previous research on e-banking service in Yemen.

10. Statement of the Problem

Banks are currently one of the main pillars on which countries rely in developing their economies. With the increasing importance of technological developments in the banking sector, this has led to banks racing to apply modern technology to raise the efficiency of their services and attract customers. Therefore, banks have introduced changes in their business models by expanding the adoption of digital technology to provide financial services alternative to traditional banking services in which customers have to visit branches to conduct their banking transactions, but now they have the option of electronic banking channels, i.e., ATMs and banking services through the Internet, mobile banking and other services that enable customers to access accounts and transactions and obtain information through them.

The introduction of electronic banking services has prompted many banks to focus on information and communication technology strategies in order to maintain their competitive edge. Electronic banking services have many advantages that create value for customer satisfaction in terms of providing high-quality services, as well as facilitating banks to increase their income and achieve a competitive advantage. Thus, banks are forced to focus on the aspects of the quality of electronic service that will determine the nature of customer satisfaction. Therefore, banks' adoption of electronic banking services prompts us to try to know the impact of electronic banking services on the financial performance of banks. Yemeni banks are not isolated from the banks of the world, as Yemeni banks continue to invest in electronic banking services and train their employees to deal with modern innovations.

As a result of the expansion of the use of electronic banking services and the severe shortage in research on the study of electronic banking services in the Yemeni context, there is need for this study to know the perception and satisfaction of customers towards electronic banking services and their quality in Yemeni banks, and to study the impact of these services on the financial performance of banks in Yemen, so the problem of

the current study has been identified in the form of four main questions that were intended to be answered in the current study, namely, are there differences in customers' perception towards e-banking service, customers' views on e-banking service quality and customers' satisfaction towards e-banking service across different demographic groups in Yemen, what are the levels of customers' perception towards e-banking service, e-banking service quality and customers' satisfaction towards e-banking service in Yemen, does e-banking service quality have an impact on customers' satisfaction in Yemen and does e-banking service have an impact on financial performance of banks in Yemen?

11. Research Questions

In light of the problem statement above, the following questions were formulated to be answered in the study:

1. Are there differences in customers' perception towards e-banking service across different demographic groups in Yemen?
2. Are there differences in customers' views on e-banking service quality across different demographic groups in Yemen?
3. Are there differences in customers' satisfaction towards e-banking across different demographic groups in Yemen?
4. What is the level of customers' perception towards e-banking service in Yemen?
5. What is the level of e-banking service quality in Yemen?
6. What is the level of customers' satisfaction towards e-banking service in Yemen?
7. Does e-banking service quality have an impact on customers' satisfaction in Yemen?
8. Do e-banking services have an impact on the financial performance of banks in Yemen?

12. Objectives of the Study

In light of the research questions above, the objectives of the present study are the following:

1. To know the profile of e-banking services in Yemen.
2. To study the difference in customers' perception towards e-banking services, customers' views on e-banking services quality and customers' satisfaction towards e-banking services across different demographic groups.
3. To measure the level of customers' perception towards e-banking services, the level of e-banking services quality and customers' satisfaction towards e-banking services in Yemen.
4. To investigate the impact of e-banking services quality on customers' satisfaction in Yemen.
5. To investigate the impact of e-banking services on the financial performance of banks in Yemen.
6. To give suggestion on e-banking services in Yemen based on the findings of the study.

13. Hypotheses

The objectives of the study have been re-written in the form of the following hypotheses.

H1. There is significant difference across gender groups in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H2. There is significant difference across age groups in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H3. There is significant difference across education groups in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H4. There is significant difference across occupation groups in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H5. There is significant difference across monthly income groups in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H6. There is significant difference across the number of years for their being customers of banks in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H7. There is significant difference across groups of customers with different length of e-banking usage in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H8. There is significant difference across groups of customers with different frequency of using e-banking service in:

a) their perception towards e-banking service,

b) their view towards banks' website design quality,

c) their view towards reliability/fulfilment quality of e-banking service,

d) their view towards security/privacy quality of e-banking service,

e) their view towards customer service quality of e-banking service,

f) their view towards overall e-banking service quality and

g) their satisfaction towards e-banking service.

H9. The level of perception of customers towards e-banking service in Yemen is high.

H10. The level of E-banking service quality in Yemen is high.

This hypothesis is restated in the form of the following sub-hypotheses:

H10.a. The level of website design quality of banks in Yemen is high.

H10.b. The level of reliability/fulfilment quality of e-banking service in Yemen is high.

H10.c. The level of security/privacy quality of e-banking service in Yemen is high.

H10.d. The level of customer service quality of e-banking service in Yemen is high.

H10.e. The level of overall service quality of e-banking in Yemen is high.

H11. The level of satisfaction of customers towards e-banking service in Yemen is high.

H12. There is significant impact of the dimensions of e-banking service quality (i.e., website design, reliability/fulfilment, security/privacy and customer service) on customers' satisfaction towards e-banking service.

H13. There is significant impact of the variables of e-banking service (i.e., No. ATM, No. Cards and No. POS) on financial performance of banks in Yemen.

This hypothesis is restated in the form of the following sub-hypotheses:

> **H13.a.** There is significant impact of the variables of e-banking service (i.e., No. ATM, No. Cards and No. POS) on Return on Assets (ROA) of banks in Yemen.
>
> **H13.b.** There is significant impact of the variables of e-banking service (i.e., No. ATM, No. Cards and No. POS) on Return on Equity (ROE) of banks in Yemen.

14. Research Methodology

The following part provides an explanation of the methodology adopted for the present study.

14.1. Research Design

The present study is a quantitative empirical study. It adopted the descriptive analytic research design to answer the research questions. The study describes customers' perception and satisfaction towards e-banking service as well as their evaluation of its quality, and then it analyzes bank's annual financial statements to draw conclusions on the impact of e-banking service on banks' financial performance.

14.2. Population and Sampling

The study involves two types of population. The first population involves the customers of Yemeni banks that provide e-banking service, and the second population is the banks themselves (i.e., the Yemeni banks that provide e-banking service). This part explains the size of each of these two types of population, the procedures used for drawing the sample from each population and the size of each sample.

First, bank customers' sample was drawn from the population of the customers of Yemeni banks that provide e-banking service. The sampling procedure used for drawing the sample was the snowball sampling technique, which is a type of convenience sampling procedures. This procedure was followed due to the difficulty which the researcher faced in contacting banks' customers because of the ongoing warfare condition in Yemen since March 2015. For the same reason, the sample included only banks' customers in the capital city of Sana'a since the researcher could not travel across the country for safety issues and also because most of the headquarters of banks and their branches are located in the capital city of Sana'a. Customers' were contacted online and offline following the same sampling procedure.

By the end of 2019, about three million citizens had at least one bank account, which forms around 10% of the population of Yemen (Institute of banking studies, 2020). Since not all bank account holders use e-banking service, the number of account holders who use e-banking services, from which the sample is drawn, was expected to be less than 3 million; however, the exact number of account holders who use e-banking services is not known since there is no available information from banks. Therefore, seeing that the sample size for a population of one million subjects in Krejcie and Morgan's table (Krejcie & Morgan, 1970, cited in Kenya Projects Organization Website, 2012) is 384, the study aimed to include more than 500 participants; however, only 454 questionnaires were returned. The online sample included 221 participants, and for the offline sample, 300 questionnaires were distributed, but only 262 questionnaires were returned, 29 of which were invalid for analysis. Therefore, the total valid questionnaires for analysis were (221 + 233 = 454 questionnaires). Thus, the sample size of banks' customers who use e-banking services involved 454 participants of banks customers who use e-banking services.

The **second** population of the study includes all the banks in Yemen that provide e-banking services, and the total number of these is 14 banks. Therefore, the sample of the banks in the present study is the same as the population. However, one of the 14 banks (Al-Amal Microfinance Bank) provides only one of the e-banking services, i.e., Electronic-money (besides SMS service that is provided by all banks but not included in the study since no data base is usually available for this service), but Electronic-money service is not one of the study variables because only five banks started offering it in 2017. Thus, Al-Amal Microfinance Bank was excluded and the sample from which

banks' annual financial statements have been drawn includes **13** banks for the period from 2010 to 2019.

14.3. Tools and Techniques Used for Data Collection

The researcher developed a questionnaire to measure the following variables: customers' perception towards e-banking service, customers' evaluation of e-banking service quality, and customers' satisfaction towards e-banking service. The researcher also analyzed the annual financial statements of banks to measure the impact of e-banking on banks' financial performance. Table number (2) below presents the tools and techniques that were used to collect data for the present study.

Table 2 Tools and Techniques Used for Data Collection

Tool / technique	Purpose
1. A questionnaire	To measure: **a.** customers' perception towards e-banking service **b.** customers' evaluation of e-banking service quality. **c.** customers' satisfaction towards e-banking service
2. Analysis of Banks' Annual Financial Statements	To measure the impact of e-banking service on banks' financial performance

14.3.1. Development of the Questionnaire

In a search for a measure of e-banking service quality, the researcher conducted an extensive literature review and found that there was no one comprehensive measure that could readily be used to measure e-banking service quality since it is a unique type of industry and has aspects that cannot be captured in measures that were developed for online shopping stores (as the majority of the existent measures were). So, the researcher developed a questionnaire to measure e-banking service quality as well as customers' perception and satisfaction towards e-banking service through restructuring of the existent measures to make them suitable for measuring e-service quality in the banking industry with its unique aspects.

The questionnaire consisted of seven parts and had 100 items, in addition to one open ended question for participants' suggestions. Part one was intended for collecting the demographic data of the participants, part two included statements that measure customers' perception towards e-banking service, parts three to six included statements that measure the quality of dimensions of e-banking service and part seven included statements that measure customers' satisfaction towards e-banking service. Parts from two to seven used a 5-point Likert scale.

After the first draft of the questionnaire was developed by the researcher, it was given to eight experts who found it to be valid for the purpose it was developed for in general, but they gave some suggestions for improving it. The researcher incorporated experts' suggestions when he prepared the second draft of the questionnaire, which was piloted on 50 participants of banks customers who use e-banking services; however, only 37 questionnaires were returned, out of which 5 were invalid for analysis. Therefore, only 32 questionnaires were analyzed in the pilot study.

Reliability of the questionnaire was tested by analyzing the 32 questionnaires which were piloted on randomly selected banks' customers who used e-banking services. The result of the reliability test produced an overall Cronbach’s alpha coefficient of 0.985. A Cronbach’s alpha coefficient of 0.7 is recommended for a newly developed questionnaire and therefore the overall Cronbach’s alpha coefficient (0.985) showed that the questionnaire was reliable. Table (3) below shows the results of Cronbach’s alpha coefficients for the questionnaire as a whole and for each part of the questionnaire.

Table 3 Reliability of the Questionnaire (SPSS output)

Parts of the Questionnaire	No. of Items	Cronbach's Alpha
Reliability of Perceptions	20	0.917
Reliability of Website Design	10	0.919
Reliability of Reliability/Fulfilment	10	0.948
Reliability of Security/Privacy	10	0.943
Reliability of Customer Service	10	0.917
Reliability of Customer satisfaction	30	0.976
Overall Reliability of the Questionnaire	90	0.985

Source: SPSS output

14.4. Data Collection

Data collection for primary data: Questionnaires were distributed in the online and offline modes. For the questionnaires distributed in the online mode, a link to the Google form of the questionnaire was sent on social media platforms (Facebook and Whatsapp) to the participants. For the offline mode of distribution, a number of banks' branches and governmental and private institutions were visited to look for banks' customers who use e-banking services. Each customer was asked to tell about their colleagues and friends who use e-banking services. The online sample included 221 participants, and for the offline sample, 300 questionnaires were distributed, but only 262 questionnaires were returned, 29 of which were invalid for analysis. Therefore, the total valid questionnaires for analysis were (221 + 233 = 454 questionnaires).

Data collection for secondary data: The annual financial statements of the banks that provide e-banking services in Yemen for the years 2010-2019 were collected from banks' websites and from the Central Bank of Yemen. The financial statements were analysed to find out the Return on Assets ROA and Return on Equity ROE, which are used in the present study to measure the financial performance of the banks (the dependent variables). And data of the independent variables (No. of ATM, No. of Cards and No. of POS) for the years 2010-2019 were collected from the reports of the Central

Bank of Yemen and from the study conducted by the Institute of banking studies in 2020 (Institute of banking studies, 2020).

14.5. Statistical Analysis of the Data

The study involved analysis of primary and secondary data. Both descriptive and inferential test were applied for data analysis using the Statistical Package for Social Studies SPSS version 26. **For the analysis of primary data**, the descriptive statistics included frequencies, percentages, means and standard deviations, and the inferential tests were independent samples t-test, one-way ANOVA test with LDS Post hoc test and multiple regression analysis.

Independent samples t-test and one-way ANOVA test (with LDS Post hoc test) were performed to find the differences in customers' perception towards e-banking service, customers' view towards e-banking service quality and customers' satisfaction towards e-banking service across the demographic variables of the present study (gender, age, education, occupation, monthly income, number of years for being customers of banks, length of e-banking usage and frequency of using e-banking service).

For determining the level of customers' perception towards e-banking service, level of e-banking service quality and level of customers' satisfaction towards e-banking service, the study used two steps to determine these levels. First, the study specified cut-off scores of low, medium and high levels. Second, after specifying the cut-off scores for the different levels, the frequencies of each level were computed using SPSS. Based on the frequencies, the level of customers' perception towards e-banking service, level of e-banking service quality and level of customers' satisfaction towards e-banking service were determined. To specify the cut-off scores, mean and standard deviation values were used for determining the low, medium and high levels as follows.

- If a customer’s total score value is $\geq \bar{X}$ + S.D., the customer is considered to have high level.
- If a customer’s total score value is $\leq \bar{X}$ - S.D., the customer is considered to have low level.

- If a customer's total score value is between $\bar{X}$ + S.D. and $\bar{X}$ - S.D., the customer is considered to have moderate level.

The cut-off scores for the low, moderate and high levels are presented in Table (4) below along with the means and standard deviations for each of the variables of the study.

Table 4 means, standard deviation and cut-off scores of the variables

Variables		N	Mean	Std. Deviation	Low	Moderate	High
Perception		454	75.71	11.26	≤ 64	65-86	≥ 87
E-service Quality	Website Design	454	34.57	7.21	≤ 27	28-41	≥ 42
	Reliability/Fulfilment	454	36.22	7.07	≤ 29	30-40	≥ 43
	Security/Privacy	454	38.73	6.62	≤ 32	33-44	≥ 45
	Customer Service	454	35.88	7.18	≤ 29	30-42	≥ 43
	Overall e-service quality	454	145.40	24.42	≤ 121	122-169	≥ 170
Customer Satisfaction		454	108.82	20.36	≤ 88	89-128	≥ 129

Source: researcher's work

Multiple regression analysis was used to investigate the impact of e-banking service quality on customers' satisfaction towards e-banking service.

For the analysis of the secondary data of the study, multiple regression analysis was used to investigate the impact of e-banking service (No. of ATM, No. of Cards and No. of POS) on banks' financial performance as measured by Return on Assets ROA and Return on Equity ROE. Before performing the multiple regression analysis, the researcher needed to calculate the Return on Assets ROA and Return on Equity ROE from banks' financial statements using the following two formulas:

Return on Assets (ROA) = Net Income / Total assets * 100

Return on Equity (ROE) = Net Income / Total Equity * 100

These formulas were used to compute the percentage of ROA and ROE for each of the ten years of the study for each bank as presented in Appendices 3 and 4. After that, the mean scores of ROA and ROE for all the banks were computed as shown in table (5) below. The mean scores were used in the regression analysis.

Table 5 Means of ROA and ROE of the Banks under Study

Years	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
ROA	1.25	-1.09	-0.03	0.02	-1.14	-5.07	0.64	0.03	-0.65	0.68
ROE	11.59	13.54	14.23	11.63	8.97	5.26	7.21	2.76	0.62	7.53

Source: researcher's work from annual financial reports of banks

15. Limitations of the Study

The present study has a number of limitations.

- The sample of the study was drawn from banks' customers in the capital city of Sana'a only because it was difficult and insecure to travel to other major cities due to the warfare going on in Yemen at the time of the study.
- One of the obstacles which the researcher faced was the non-availability of some of the data related to e-banking service, such as the number and volume of electronic transfers. Therefore, the researcher could not include this aspect of e-banking service in the present study.
- Another obstacle that the researcher faced was the difficulty of finding all data in the annual financial statements of some banks in Yemen in the period of the study.
- Measuring e-banking service quality is based on customers' perspectives only and not on bankers' perspectives.

16. Structure of The Study

This research study has been presented in five chapters:

- **Chapter I:** Introduction
- **Chapter II:** Review of Literature and Conceptual Framework.
- **Chapter III:** Banking Industry in Yemen – A Discussion.

- **Chapter IV:** Perception and Satisfaction of Customers on E-Banking and Its Impact on Financial Performance of Banks - Data Analysis and Interpretation.
- **Chapter V:** Summary of Findings, Suggestions and Conclusion.

17. Findings of the Study

The findings of the present study have been sorted based on the objectives of the study as follows.

17.1. Findings Related to the Difference in Customers' Perception towards E-Banking Service across Different Demographic Groups

- There is no significant difference in customers' perception towards e-banking service between male and female customers in Yemen; independent samples *t*-test revealed a non-significant t-value (*t*= -.240; *P*= .811). This finding is not consistent with the findings in the studies of Ganpathi (2016) and Koti (2016) who found that there is difference in perception between genders.
- There is a significant difference in perception towards e-banking service among the different age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 3.163; *P*= .014). The below 25 years old group had a higher mean score than the three age groups of between 26-35, 36-45 and 46-55 years old groups; indicating that the below 25 years old group had higher perception towards e-banking service than the these three age groups, but there was no significant difference in perception between the below 25 years old group and the above 56 year age group. This finding is in accordance with the findings of Fozia (2013), Ganpathi (2016) and Suresh (2016) who found differences in perception among age groups.
- There is a significant difference in customers' perception towards e-banking service across education groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 2.432; *P*= 0.034). the Master Degree holders had a lower mean score than the three education groups of High school, Diploma and Degree holders; indicating that the Master Degree holders group had lower perception towards e-banking service than these three education groups, but there was no significant difference in perception towards e-banking

service between the Master Degree holders group and the Elementary school group and the PhD holders group. This finding is in accordance with the findings of Ganpathi (2016) who found differences in perception among education groups.

- There is a significant difference in customers' perception towards e-banking service across occupation groups of Yemeni customers; one-way ANOVA test resulted in a significant *F*-value (*F*= 2.726; *P*= 0.019). the group labelled 'other' had the lowest perception towards e-banking service among all the other occupation groups. This finding is in accordance with the findings of Fozia (2013) and Ganpathi (2016) who found differences in perception among occupation groups.
- There is no significant difference in customers' perception towards e-banking service across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 1.445; *P*= 0.229). This finding contradicts the findings of Ganpathi (2016) who found difference in customers' perception towards e-banking service across monthly income groups.
- There is no significant difference in customers' perception towards e-banking service across the number of years for their being customers of banks in Yemen; One-way ANOVA test showed a non-significant *F*-value (*F*= 2.102; *P*= 0.099).
- There is no significant difference in Yemeni customers' perception towards e-banking service across the groups with different length of e-banking usage; one-way ANOVA test revealed a non-significant *F*-value (*F*= 0.769; *P*= 0.512).
- There is no significant difference in perception towards e-banking service across groups of Yemeni customers with different frequency of using e-banking service; one-way ANOVA test revealed a non-significant *F*-value (*F*= 2.232; *P*= 0.065). This finding is not in concordance with the findings of Ganpathi (2016) who found difference in perception towards e-banking service across groups of customers with different frequency of using e-banking service.

17.2. Findings Related to the Difference in Customers' Views on Banks' Website Design Quality across Different Demographic Groups

- There is no significant difference between male and female customers in Yemen in their view of banks' website design quality; independent samples t-test revealed a non-significant t-value (*t*= -.083; *P*= .934).

- There is a significant difference in customers' views towards banks' website design quality across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 2.953; *P*= .020). the below 25 years old group had a higher mean score than the three age groups of between 26-35, 36-45 and 46-55 years old; indicating that the below 25 years old group rated banks' website design quality higher than the rating of these three age groups, but there was no significant difference in the rating of website design quality between the below 25 years old group and the above 56 year age group.
- There is a significant difference in customers' view towards banks' website design quality across education groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 2.828; *P*= 0.016). the High school certificate holders rated banks' website design quality significantly higher than the two education groups of Degree and Master Degree holders, but there was no difference in rating banks' website design quality between the High school certificate holders and Elementary school certificate holders, Diploma and the PhD holders. Also, Degree holders rated banks' website design quality significantly higher than the Master Degree holders.
- There is a significant difference in customers' view towards banks' website design quality across occupation groups of Yemeni customers; one-way ANOVA test resulted in a significant *F*-value (*F*= 2.628; *P*= 0.023). government employees rated banks' website design quality significantly lower than the two occupation groups of the self-employed and students, but there is no difference in the rating of banks' website design quality between government employees and Private Employees, Business owners and the group labelled 'other'. Also, the group labelled 'other' rated banks' website design quality significantly lower than the two occupation groups of business owners and students.
- There is no significant difference in customers' view towards banks' website design quality across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 0.702; *P*= 0.551).
- There is no significant difference in customers' views towards banks' website design quality across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a non-significant *F*-value (*F*= 2.440; *P*= 0.064).

- There is no significant difference in Yemeni customers' views towards banks' website design quality across the groups with different length of e-banking usage; one-way ANOVA test revealed a non-significant *F*-value (*F*= 2.441; *P*= 0.064).
- There is no significant difference in Yemeni customers' views towards banks' website design quality across the groups with different frequency of using e-banking service; one-way ANOVA test showed a non-significant *F*-value for (*F*= 2.260; *P*= 0.062).

17.3. Findings Related to Customers View towards Reliability/Fulfilment Quality of E-Banking Service across Different Demographic Groups

- There is no significant difference between male and female customers in Yemen in their view towards Reliability/Fulfilment quality of e-banking service in Yemen; independent samples t-test revealed a non-significant t-value (*t*= -.243; *P*= .808).
- There is a significant difference in customers' views towards reliability/fulfilment quality of e-banking service across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 6.362; *P*= 0.001). the below 25 years old group had the highest mean score among all age groups; indicating that the below 25 years old group rated reliability/fulfilment quality of e-banking service higher than the rating of these other age groups. Also, the age group of between 26-35 years had a higher mean score than the age group of between 36-45 years; indicating that the between 26-35 years old group rated reliability/fulfilment quality of e-banking service higher than the rating of the age group of between 36-45 years old.
- There is no significant difference in customers' view towards reliability/fulfilment quality of e-banking service across education groups of Yemeni customers; one-way ANOVA test revealed a non-significant *F*-value (*F*= 1.823; *P*= 0.107).
- There is no significant difference in customers' views towards reliability/fulfilment quality of e-banking service across occupation groups of Yemeni customers; one-way ANOVA test resulted in a non-significant *F*-value (*F*= 2.094; *P*= 0.065).

- There is no significant difference in customers' view towards reliability/fulfilment quality of e-banking service across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 0.825; *P*= 0.480).
- There is significant difference in customers' views towards reliability/fulfilment quality across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a significant *F*-value (*F*= 2.794; *P*= 0.040). Those who have been customers for banks for less than 1 year rated reliability/fulfilment quality significantly higher than all the other groups.
- There is no significant difference in Yemeni customers' views towards reliability/fulfilment quality of e-banking service across the groups with different length of e-banking usage; one-way ANOVA test had a non-significant *F*-value (*F*= 2.227; *P*= 0.084).
- There is no significant difference in Yemeni customers' views towards reliability/fulfilment quality of e-banking service across the groups with different frequency of using e-banking service; one-way ANOVA test revealed a non-significant *F*-value for (*F*= 0.938; *P*= 0.442).

17.4. Findings Related to Customers View towards Security/Privacy Quality of E-Banking Service across Different Demographic Groups

- There is no significant difference in the two genders' views towards security/privacy quality of e-banking service in Yemen; independent samples t-test revealed a non-significant t-value (*t*= -.217; *P*= .828).
- There is a significant difference in customers' views towards security/privacy quality of e-banking service across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 3.546; *P*= 0.007). the below 25 years old group had a higher mean score than all the other age groups; indicating that the below 25 years old group rated security/privacy quality of e-banking service higher than the rating of the other age groups.
- There is no significant difference in customers' view towards security/privacy quality of e-banking service across education groups of Yemeni customers; one-way ANOVA test revealed a non-significant *F*-value (*F*= 1.763; *P*= 0.119).

- There is a significant difference in customers' view towards security/privacy quality of e-banking service across occupation groups of Yemeni customers; One-way ANOVA test resulted in a significant *F*-value (*F*= 2.928; *P*= 0.013). Government employees rated security/privacy quality significantly lower than private employees, but there is no difference in the rating of security/privacy quality between government employees and the Self-Employed, Business owners, Students and the group labelled 'other'. Also, the group labelled 'other' rated security/privacy quality significantly lower than the four occupation groups of the private employees, the self-employed, business owners and students.
- There is no significant difference in customers' view towards security/privacy quality of e-banking service across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 0.513; *P*= 0.673).
- There is no significant difference in customers' views towards security/privacy quality across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a non-significant *F*-value (*F*= 0.193; *P*= 0.901).
- There is no significant difference in Yemeni customers' views towards security/privacy quality of e-banking service across the groups with different length of e-banking usage; one-way ANOVA test revealed a non-significant *F*-value (*F*= 0.143; *P*= 0.934).
- There is no significant difference in Yemeni customers' views towards security/privacy quality of e-banking service across the groups with different frequency of using e-banking service; one-way ANOVA test showed a non-significant *F*-value (*F*= 1.079; *P*= 0.366).

17.5. Findings Related to Customers View towards Customer Service Quality of E-Banking Service across Different Demographic Groups

- There is no significant difference between male and female customers on their views towards Customer Service quality of e-banking service in Yemen; independent samples t-test revealed a non-significant t-value (*t*= -.833; *P*= .405).
- There is a significant difference in customers' views towards customer service quality of e-banking service across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 5.431; *P*= 0.001). the below 25

years old group had a higher mean score than the three age groups of between 26-35, 36-45 and 46-55 years; indicating that the below 25 years old group rated customer service quality of e-banking service higher than the rating of these three age groups, but there was no significant difference in the rating of customer service quality between the below 25 years old group and the above 56 year age group. Also, the age group of between 26-35 years had a higher mean score than the age group of between 36-45 years; indicating that the between 26-35 years old group rated customer service quality of e-banking service higher than the rating of the age group of between 36-45 years old.

- There is a significant difference in customers' view towards customer service quality of e-banking service across education groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 3.055; *P*= 0.010). Master Degree holders rated customer service quality significantly lower than the two education groups of Diploma and Degree holders, but there was no difference in the rating of customer service quality between Master Degree holders and Elementary school and High school certificate holders and PhD holders.
- There is a significant difference in customers' view towards customer service quality of e-banking service across occupation groups of Yemeni customers; one-way ANOVA test resulted in a significant *F*-value (*F*= 2.636; *P*= 0.023). Students rated customer service quality significantly higher than government employees, the self-employed and the group labelled 'other', but there was no difference in the rating of customer service quality between students and Private Employees and business owners. Also, the group labelled 'other' rated customer service quality significantly lower than private employees, the self-employed, business owners and students.
- There is no significant difference in customers' view towards customer service quality of e-banking service across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 2.141; *P*= 0.094).
- There is significant difference in customers' views towards customer service quality across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a significant *F*-value (*F*= 3.475; *P*= 0.016). those who have been customers for banks for above 10 years rated customer service quality significantly lower than those who have been banks' customers for less than 1 year and those who have been banks' customers for between 1 - 5 years,

but there was no difference in the rating of customer service quality between those who have been customers for banks for above 10 years and those who have been banks' customers for between 5 – 10 years.

- There is a significant difference in Yemeni customers' views towards customer service quality of e-banking service across the groups with different length of e-banking usage; one-way ANOVA test showed a significant *F*-value (*F*= 2.979; *P*= 0.031). customers who have been using e-banking service for above 10 years rated customer service quality lower than those who have been using e-banking service for less than 1 year and those who have been using it for between 1 - 5 years, but there was no difference in the rating of customer service quality between customers who have been using e-banking service for above 10 years and those who have been using it for between 5 – 10 years.
- There is no significant difference in Yemeni customers' views towards customer service quality of e-banking service across the groups with different frequency of using e-banking service; one-way ANOVA test revealed a non-significant *F*-value (*F*= 1.866; *P*= 0.115).

17.6. Findings Related to Customers View towards Overall E-Banking Service Quality across Different Demographic Groups

- There is no significant difference between male and female customers on their views towards overall e-banking service quality in Yemen; independent samples t-test revealed a non-significant t-value (*t*= -.399; *P*= 0.690).
- There is a significant difference in customers' views towards overall e-banking service quality across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 5.761; *P*= 0.001). the below 25 years old group had the highest mean score among all the other age groups; indicating that the below 25 years old group rated overall e-banking service quality higher than all the other age groups. Also, the age group of between 26-35 years had a higher mean score than the age group of between 36-45 years; indicating that the between 26-35 years old group rated overall e-banking service quality higher than the rating of the age group of between 36-45 years old.
- There is a significant difference in customers' view towards overall e-banking service quality across education groups of Yemeni customers; one-way

ANOVA test revealed a significant *F*-value (*F*= 2.742; *P*= 0.019). High school certificate holders rated overall e-banking service quality significantly higher than the three education groups of Degree, Master Degree and PhD holders, but there is no difference in the rating of overall e-banking service quality between High school certificate holders and Elementary school certificate and Diploma holders. Also, Degree holders rated overall e-banking service quality significantly higher than Master Degree holders. This finding is consistent with the findings of Dhanya and Velmurugan (2021) who found difference in customers' view towards overall e-banking service quality across education groups

- There is a significant difference in customers' view towards overall e-banking service quality across occupation groups of Yemeni customers; one-way ANOVA test resulted in a significant *F*-value (*F*= 3.133; *P*= 0.009). government employees rated overall e-banking service quality significantly lower than private employees and students, but there was no difference in the rating of overall e-banking service quality between government employees and the Self-Employed, Business owners and the group labelled 'other'. Also, the group labelled 'other' rated overall e-banking service quality significantly lower than the private employees, the self-employed, business owners and students.
- There is no significant difference in customers' view towards overall e-banking service quality across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 0.722; *P*= 0.539). this finding contradicts the finding in Dhanya and Velmurugan (2021) study, where there was difference in customers' view towards e-banking service quality across monthly income groups
- There is no significant difference in customers' views towards overall e-banking service quality across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a non-significant *F*-value (*F*= 2.300; *P*= 0.077).
- There is no significant difference in Yemeni customers' views towards overall e-banking service quality across the groups with different length of e-banking usage; one-way ANOVA test revealed a non-significant *F*-value (*F*= 1.757; *P*= 0.155).

- There is no significant difference in Yemeni customers' views towards overall e-banking service quality across the groups with different frequency of using e-banking service; One-way ANOVA test showed a non-significant *F*-value (*F*= 1.705; *P*= 0.148).

17.7. Findings Related to the Difference in Customers' Satisfaction towards E-Banking Service across Different Demographic Groups

- There is no significant difference between male and female customers on their satisfaction towards e-banking service in Yemen; independent samples t-test revealed a non-significant t-value (*t*= .052; *P*= 0.959). this finding contradicts the findings of Anisha and Jeba Melvin (2018) and Teka and Sharma (2017) who found difference in satisfaction between genders, and the finding is consistent with the finding of Dhanya and Velmurugan (2021) who found no difference in satisfaction between genders.
- There is a significant difference in customers' satisfaction towards e-banking service across age groups of Yemeni customers; one-way ANOVA test revealed a significant *F*-value (*F*= 3.829; *P*= 0.005). the below 25 years old group had a higher mean score than the three age groups of between 26-35, 36-45 and 46-55 years; indicating that the below 25 years old group had higher satisfaction towards e-banking service than these three age groups, but there was no significant difference in had higher satisfaction towards e-banking service between the below 25 years old group and the above 56 year age group. Also, the age group of between 26-35 years had a higher mean score than the age group of between 36-45 years; indicating that the between 26-35 years old group had higher satisfaction towards e-banking service than the age group of between 36-45 years old. This finding is consistent with the findings of Anisha and Jeba Melvin (2018), Elavarasi and Surulivel (2014), Harb and Saleh (2020), Worku, Tilahun and Tafa (2016) who found difference in satisfaction across age groups, but the finding of the present study contradicts the findings of Dhanya and Velmurugan (2021), Ramanigopal, Palaniappn, Hwmalatha and Mani (2011) and Teka and Sharma (2017) who found no difference in satisfaction across age groups.

- There is a significant difference in customers' satisfaction towards e-banking service across education groups of Yemeni customers; one-way ANOVA revealed a significant *F*-value (*F*= 2.661; *P*= 0.022). High school certificate holders had higher satisfaction towards e-banking service than the three education groups of Degree, Master Degree and PhD holders, but there is no difference in satisfaction towards e-banking service between High school certificate holders and Elementary school certificate and Diploma holders. Also, Degree holders had higher satisfaction towards e-banking service than Master Degree holders. This finding is consistent with the findings of Aydin (2014), Elavarasi and Surulivel (2014), Harb and Saleh (2020), Ramanigopal, Palaniappn, Hwmalatha and Mani (2011) and Worku, Tilahun and Tafa (2016) who found difference in satisfaction across education groups, while this finding was different than the finding in Teka and Sharma's study (2017), who found no difference in satisfaction across education groups.
- There is a significant difference in customers' satisfaction towards e-banking service across occupation groups of Yemeni customers; one-way ANOVA test had a significant *F*-value (*F*= 2.945; *P*= 0.013). Government employees had lower satisfaction towards e-banking service than private employees, but there was no difference in satisfaction between government employees and the self-employed, business owners, students and the group labelled 'other'. Also, the group labelled 'other' had lower satisfaction towards e-banking service than private employees, the self-employed, business owners and students. This finding is consistent with the findings of Anisha and Jeba Melvin (2018), Elavarasi and Surulivel (2014), Harb and Saleh (2020), Ramanigopal, Palaniappn, Hwmalatha and Mani (2011) and Worku, Tilahun and Tafa (2016) who found difference in satisfaction across occupation groups, while this finding is not consistent with the finding of Teka and Sharma (2017) who found no difference in satisfaction across occupation groups.
- There is no significant difference in customers' satisfaction towards e-banking service across monthly income groups in Yemen; one-way ANOVA test showed a non-significant result (*F*= 0.925; *P*= 0.429). This finding was not consistent with the findings of Elavarasi and Surulivel (2014), Harb and Saleh (2020), Ramanigopal, Palaniappn, Hwmalatha and Mani (2011) and Worku, Tilahun and Tafa (2016) who found difference in satisfaction across monthly

income groups, while this finding is consistent with the finding of Teka and Sharma (2017) who found no difference in satisfaction across monthly income groups.

- There is no significant difference in customers' satisfaction towards e-banking service across the number of years for their being customers of banks in Yemen; one-way ANOVA test showed a non-significant *F*-value (*F*= 2.492; *P*= 0.060).
- There is no significant difference in Yemeni customers' satisfaction towards e-banking service across the groups with different length of e-banking usage; one-way ANOVA test revealed a non-significant *F*-value (*F*= 2.490; *P*= 0.060).
- There is no significant difference in satisfaction towards e-banking service across groups of Yemeni customers with different frequency of using e-banking service; one-way ANOVA test revealed a non-significant *F*-value (*F*= 1.274; *P*= 0.279).

17.8. Findings related to the Level of Customers' Perception towards E-Banking Service, Level of E-Banking Service Quality and Level of Customers' Satisfaction towards E-Banking Service

- The majority of Yemeni customers (71.4%) had a moderate level of perception towards e-banking service. This finding is not consistent with the findings in previous research where several previous studies found that the perception of customers' towards e-service was high (e.g., Adams, 2019; Tandon, Goel and Bishnoi, 2016; Kumar, 2015), while a few studies found that customers' perception was low (e.g., Nair, 2020).
- The majority of Yemeni customers (71.1%) found that the website design of banks providing e-banking service had moderate level of quality.
- The majority of Yemeni customers (71.8%) found the reliability/fulfilment of e-banking service to be of a moderate level of quality**.** This finding is not in line with the findings of previous research, where the level of reliability/fulfilment quality of e-banking service was found to be low in some previous studies like the study of Abadi and Nematizadeh (2012).
- The majority of Yemeni customers (62.8%) found that the security/privacy of e-banking service to be of a moderate level of quality**.** This finding is not in line with the findings of previous research, where the level of security/privacy

quality of e-banking service was found to be low in some previous studies like the study of Abadi and Nematizadeh (2012), or high in some other studies (e.g., Tharanikaran, Sritharan and Thusyanthy (2017).

- The majority of Yemeni customers (69.6%) had the view that the customer service of e-banking service was of a moderate level of quality
- The majority of Yemeni customers (69.6%) had the view that the overall e-banking service was of a moderate level of quality**.** This finding is not in line with the findings of previous research, where the level of e-banking service quality was found to be high in some previous studies, such as the study of Tharanikaran, Sritharan and Thusyanthy (2017), or low in some other studies, such as the study of Ejigu (2016).
- The majority of Yemeni customers (73.6%) had a moderate level of satisfaction towards e-banking service**.** This finding is not consistent with the findings in previous research where several previous studies found that the satisfaction of customers' towards e-service was high (e.g., Adams (2019); Madavan and Vethirajan (2020); Ramanigopal, Palaniappn, Hwmalatha and Mani (2011); Tharanikaran, Sritharan and Thusyanthy (2017).

17.9. Findings related to the Impact of E-Banking Service Quality on Customers' Satisfaction towards E-Banking

- The four dimensions of e-banking service quality (Website Design, Reliability/Fulfilment, Security/Privacy and Customer Service) explained 73.3% of variation in customers' satisfaction towards e-banking service (R^2 = 0.733). ANOVA *F*-value (F = 308.379, P = 0.000) confirmed that the model was a good fit of the data, and the obtained t values for all the predictors were found to be highly significant $p < 0.001$, indicating that e-banking service quality has a positive correlation and impact on customers' satisfaction towards e-banking service. This finding is consistent with the findings in some previous research, where e-banking service was found to be related and have an impact on customer satisfaction (e.g., Asfaw, 2017; Aydin, 2014; Hammoud, Bizri and El Baba, 2018; Das and Ravi, 2021; Hadid, Soon and Amreeghah, 2020; Ejigu, 2016; Harijanto and Watson, 2021; Hayati, 2020; Omodele and Onyeiwu, 2019; Yitbarek, 2015). But the finding of the present study contradicts the findings in

some other research (e.g., Basel and Omar, 2016; Salimon, Mokhtar, Bin Yusoff and Adeleke, 2017).

17.10. Findings Related to Impact of E-Banking Service on Financial Performance

- E-banking service variables (No. of Cards, No. of ATM) explain 62.5% of variation in Return on Assets ROA ($R^2 = 0.625$). ANOVA *F*-value ($F = 5.834$, $P = 0.032$) confirmed that the model was a good fit of the data, and the obtained *t* values revealed that the explanatory variable No. of Cards ($p = 0.023$) has an impact on financial performance of Yemeni banks as measured by ROA, while the explanatory variable No. of ATM ($p = 0.071$) does not have an impact on financial performance of Yemeni banks as measured by ROA. Comparing these findings with previous research, the finding that No. of Cards has an impact on ROA is consistent with the findings in some previous research, such as the studies of Aduda and Kingoo (2012), Damtew (2016) and Manesh, Mohamadi and kiani (2013). Howerver, the finding that No. of ATM does not have an impact on ROA is consistent with some previous studies (e.g., Damtew, 2016; Halili, 2014) and inconsistent with some other studies (e.g., Aduda and Kingoo, 2012; Ariyasena and Jayarathne, 2019; Madugba, Egbide, Jossy, Agburuga and Chibunna, 2021; Ngumi, 2014; Oyewole, Abba, El-maude and Gambo, 2013; S.M, Kassa and Hamid, 2017; Siddik. Sun, Kabiraj, Shanmugan and Yanjuan, 2016; Yang, Li, Ma and Chen, 2018).
- E-banking service variables (No. of Cards, No. of ATM) explain 73.8% of variation in Return on Equity ROE ($R^2 = 0.738$). ANOVA *F*-value ($F = 9.865$, $P = 0.009$) confirmed that the model was a good fit of the data, and the obtained *t* values revealed that the explanatory variable No. of ATM ($p = 0.008$) has an impact on financial performance of Yemeni banks as measured by ROE, while the explanatory variable No. of Cards ($p = 0.082$) does not have an impact on financial performance of Yemeni banks as measured by ROE. Comparing these findings with previous research, the finding that No. of ATM has an impact on ROE is consistent with the findings in some previous research, such as the studies of Siddik, Sun, Kabiraj, Shanmugan and Yanjuan (2016), S.M, Kassa

and Hamid (2017) and Yang, Li, Ma and Chen (2018), and inconsistent with the findings in some other research, such as the studies of Halili (2014) and Kamboh and Leghari (2016). Similarly, the finding that No. of Cards does not have an impact on ROE is consistent with the findings in some previous research, such as the study of Al-Smadi and Alwabel (2011), and inconsistent with the findings in some other research, such as the study of Al-Qudah, al-Hawary and al-Mehsen (2012).

18. Suggestions

1. Banks should provide continuous training to their workers to develop their abilities and skills by conducting training courses in the field of information and communication technology in general and e-banking service in particular due to their rapid and continuous development.
2. Banks should invest in promoting and introducing their e-banking services to the public and highlighting the advantages of these services to improve Yemeni customers' perception towards e-banking service.
3. Banks should conduct continuous studies of customers' rapidly changing needs, expectations and desires to be able to improve their satisfaction towards e-banking service, and to help banks to attract new customers, which in turn improves their financial performance.
4. Banks should work continuously on providing a wider range of e-banking services and improving their quality.
5. Banks should work continuously on monitoring e-banking service quality and its compliance to customers' perceptions and expectations of e-service quality.
6. Banks should keep in pace with the regional and international advances in e-banking services to retain their customers and attract new ones.
7. Banks should increase the number of ATMs, make ATMs available in main markets and streets and increase the allowed daily withdrawal limit.
8. Banks should improve customer service quality to enhance customers' satisfaction and solve any problems they may face.
9. Banks should encourage the trading sector to start providing points of sale service for the convenience of their customers.
10. Banks should have teams for the continuous innovation in security systems for

the safety of their systems from any hacking or fraudulent actions that may affect the security of their systems and the privacy of their customers' information.

11. Banks should enhance the infrastructure of their information and communication technology systems, which in turn improves the performance of banks in general.
12. The government and Internet providers should work on improving Internet speed which is the corner stone of electronic services in general and e-banking service in particular.
13. International community ought to work to end the ongoing war in Yemen since 2015 for the recovery of Yemeni economic condition, which in turn leads to a recovery and improvement of all services in the country.

19. Areas for Future Research

The researcher in the present study recommends the following topics to be investigated in future studies on e-banking in Yemen.

- Similar studies can be conducted on Yemeni customer perception and satisfaction towards e-banking service including participants from all areas of the country especially after the end of the war in Yemen.
- Studies can be conducted on electronic wallets provided by banks in Yemen.
- Studies can be conducted on the impact of other e-banking service channels on financial performance of banks in Yemen.
- Studies can be conducted on the impact of technology on the service quality of banks in Yemen.

20. Conclusion

The present study aimed to investigate the perception and satisfaction of customers towards e-banking and its impact on financial performance of banks in Yemen. The study adopted the descriptive analytic research design to answer the research questions. The sample size involved 454 participants of banks customers who use e-banking services, and the study includes all the banks in Yemen that provide e-banking services,

the total number of which is 13 banks. A questionnaire was developed by the researcher to measure the following variables: customers' perception towards e-banking service, customers' evaluation of e-banking service quality, and customers' satisfaction towards e-banking service. The researcher also analyzed the annual financial statements of banks to measure the impact of e-banking on banks' financial performance. For the analysis of primary data, the descriptive statistics included frequencies, percentages, means and standard deviations, and the inferential tests performed were independent samples *t*-test, one-way ANOVA test with LSD Post hoc test and multiple regression analysis. For the analysis of the secondary data of the study, multiple regression analysis was used to investigate the impact of e-banking service on banks' financial performance as measured by Return on Assets ROA and Return on Equity ROE. Findings of the study revealed that Yemeni bank customers who use e-banking service have moderate level of perception and satisfaction towards e-banking service. The study found that the level of e-banking service quality of Yemeni banks is moderate. E-banking service quality was found in the present study to have an impact on customers' satisfaction towards e-banking service in Yemen. No. of Cards was found to have an impact on financial performance of Yemeni banks as measured by ROA, while No. of ATM was found to have an impact on financial performance of Yemeni banks as measured by ROE. In light of these findings, the study recommended, among other recommendations, that banks should invest in promoting and introducing their e-banking services to the public, conduct continuous studies of customers' rapidly changing needs, expectations and desires towards e-banking service, provide a wider range of e-banking services and continuously monitor e-banking service quality and improve customer service quality to enhance customers' satisfaction and thereby improve their performance.

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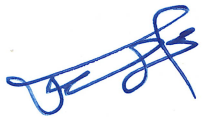

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